

CLAIMS

1 1. A method for inserting a given node into ring operations of an ATM ring,  
2 including the steps of:  
3       A. operating the given node as a bypass for ATM traffic on the ring;  
4       B. operating the given node to pass through virtual paths known to the given  
5       node;  
6       C. establishing connection to inter-ring management channel;  
7       D. exchanging information between the given node and a ring hub node to operate  
8       the given node as a pass through for the ATM traffic on other existing virtual path  
9       connections on the ring;  
10      E. assigning to the given node one or more virtual paths to direct traffic to and  
11      from the given node over the ring;  
12      F. communicating the virtual path assignment to all nodes on the ring; and  
13      G. providing to the given node connection information for all of the virtual paths  
14      and virtual circuits on the ring.

1 2. The method of claim 1 wherein the step of providing connection information to the  
2 given node includes providing routing tables to the given node.

1 3. The method of claim 2 wherein the step of providing connection information further  
2 includes providing the information from the hub node to the given node.

1 4. The method of claim 3 wherein the step of providing connection information further  
2 includes  
3       i. providing an error checking code with the information, and  
4       ii. at the given node checking the information with the error checking code to  
5       determine that the information is correct.

1 5. The method of claim 1 wherein the step of assigning the virtual path to the given node  
2 further includes

3       i.     the given node requesting the assignment from the hub node; and  
4       ii.    the hub node responding to the request with the assignment.

1     6. The method of claim 1 wherein the step of communicating the virtual path assignment  
2     to all of the nodes includes updating routing tables maintained by the nodes.

1     7. The method of claim 1 wherein the step of communicating the virtual path assignment  
2     to all of the nodes includes providing to the nodes call set up information for calls over  
3     the newly assigned virtual path.

1     8. The method of claim 1 further including the steps of  
2       F. establishing connections to and from the given node over the assigned virtual  
3     path; and  
4       G. tearing down connections over the assigned virtual path.

1     9. The method of claim 8 wherein the step of communicating the virtual path assignment  
2     to all of the nodes includes updating routing tables maintained by the nodes.

1     10. The method of claim 9 further including updating the routing tables with call set up  
2     and tear down information associated with the one or more virtual paths assigned to the  
3     given node.

1     11. The method of claim 1 further including the step of, at the given node, shaping traffic  
2     over the virtual circuits associated with the established connections on the ring.

1     12. A method for removing a failed node from an ATM ring, the method including the  
2     steps of :  
3       A. determining that a given node has failed;  
4       B. tearing down virtual circuit connections directed to or initiating from the failed  
5     node;  
6       C. tearing down virtual paths assigned to the failed node; and

7                   D. providing to the remaining nodes on the ring updated ring topology  
8 information that excludes the failed node.

1       13. The method of claim 12 wherein  
2                   i. the step of determining that the given node has failed includes having a ring  
3                   hub node determine the failure, and  
4                   ii. the steps of tearing down the virtual circuit and virtual path connections are  
5                   controlled by the hub node.

1       14. A method for inserting a given node into ring operations of an ATM ring and  
2                   removing a failed node from the ring operations, the method including the steps of:  
3                   A. operating the given node as a bypass for ATM traffic on the ring;  
4                   B. placing all other known virtual paths in by pass mode;  
5                   C. establishing connection to inter-ring management channel;  
6                   D. exchanging information between the given node and a ring hub node to operate  
7                   the given node as a pass through for the ATM traffic on existing connections on the ring;  
8                   E. assigning to the given node one or more virtual paths to direct traffic to and  
9                   from the given node over the ring;  
10                  F. communicating the virtual path assignment to all nodes on the ring; and  
11                  G. providing to the given node connection information for all of the virtual paths  
12                  and virtual circuits on the ring.

13       15. The method of claim 14 wherein the step of providing connection information to the  
14 given node includes providing routing tables to the given node.

1       16. The method of claim 15 wherein the step of providing connection information further  
2                   includes providing the information from the hub node to the given node.

1       17. The method of claim 15 wherein the step of providing connection information further  
2                   includes  
3                   iii. providing a error checking code with the information, and

4                   iv. at the given node checking the information with the error checking code to  
5                   determine that the information is correct.

1 18. The method of claim 14 wherein the step of assigning the virtual path to the given  
2 node further includes

1 19. The method of claim 14 wherein the step of communicating the virtual path  
2 assignment to all of the nodes includes updating routing tables maintained by the nodes.